

Exploring the Feasibility cold-FET Calibration Standards to Improve Radiometric Measurements

Completed Technology Project (2014 - 2015)



Project Introduction

This work seeks to further the development of the cold-FET calibration technology designed for next generation multi-band microwave instruments for space-based remote sensing applications. The short term goal of this IRAD is to quantify the plausibility of implementing and advancing cold-FETs, as tradeoffs exist between the technical-feasibility of this utility i.e., impact to the science

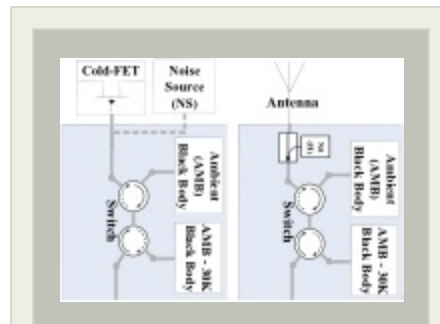
measurement, SWaP minimization, adaptability to current and future mission instruments, and the nontechnical-feasibility such as cost, ease of implementation, and the level of effort (LOE) in advancing the cold-FET towards a stand-alone cold-calibration standard, which is the long-term goal of this work.

Thus this study consists of two phases. Phase 1, the Research Study and Literature Review, will be conducted to determine the non technical-feasibility of this technology. Phase 2 is an Empirical Research Study in cold-FET Calibration, embodies a creative approach to performing various calibration studies.

Anticipated Benefits

We believe this study will provide us with the information to fulfill the long-term goal of the design and development of a cold-FET as a stand-alone cold-calibration standard.

This project is expected to benefit any government agency interested in measuring snow and ice parameters such as SWE, snow depth, etc. Thus NOAA and the NWS are two organizations who will directly benefit from this work as the cold-FET technology matures as expected.



Current WISM radiometer configuration (top) and the radiometer configured as the measurement test bed (bottom).

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Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★ Goddard Space Flight Center (GSFC)	Lead Organization	NASA Center	Greenbelt, Maryland

Primary U.S. Work Locations

Maryland

Organizational Responsibility

Responsible Mission Directorate:

Mission Support Directorate (MSD)

Lead Center / Facility:

Goddard Space Flight Center (GSFC)

Responsible Program:

Center Independent Research & Development: GSFC IRAD

Project Management

Program Manager:

Peter M Hughes

Project Manager:

Terence A Doiron

Principal Investigator:

Quenton Bonds

Co-Investigators:

Edward J Kim

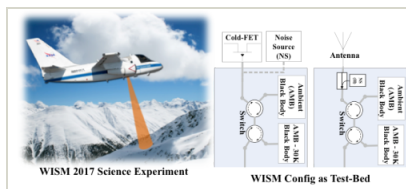
Giovanni De Amici

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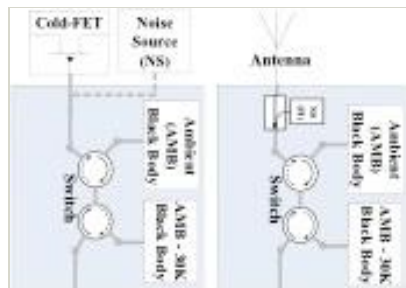


Images



Exploring the Feasibility cold-FET Calibration Standards to Improve Radiometric Measurements Project

Exploring the Feasibility cold-FET Calibration Standards to Improve Radiometric Measurements Project (<https://techport.nasa.gov/image/19350>)

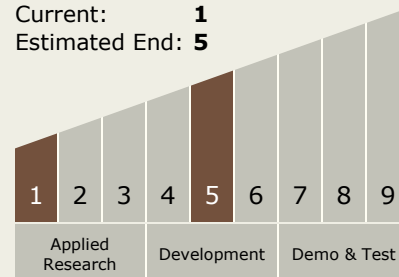


Measurement Test Bed

Current WISM radiometer configuration (top) and the radiometer configured as the measurement test bed (bottom). (<https://techport.nasa.gov/image/4206>)

Technology Maturity (TRL)

Start: **1**
Current: **1**
Estimated End: **5**



Technology Areas

Primary:

- TX08 Sensors and Instruments
 - TX08.1 Remote Sensing Instruments/Sensors
 - TX08.1.4 Microwave, Millimeter-, and Submillimeter-Waves